

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE AND PROCESS OF
PRODUCTION AND WRITE METHOD THEREOF

5

ABSTRACT OF THE DISCLOSURE

A nonvolatile semiconductor memory device
featuring a reducing operating voltage while maintaining
a good disturbance characteristic and high speed in a
10 write operation, including a gate insulating film and
gate electrode stacked on a channel forming region of a
semiconductor provided on the surface of a substrate and
planarily dispersed charge storing means such as carrier
traps in a nitride film or near the interface with the
15 top insulating film, provided in the gate insulating
film, the gate insulating film including an FN tunnel
film having a dielectric constant larger than that of a
silicon oxide film and exhibiting an FN
electroconductivity, whereby the thickness of the gate
20 insulating film, converted to that of a silicon oxide
film, can be reduced and the voltage can be reduced.
Further, to reduce the operation voltage, it is possible
to provide a pull-up electrode ^{is provided} near the gate electrode
through the dielectric film and ^a pull-up gate bias circuit
25 supplying a predetermined voltage to the same and boost

the gate electrode by capacity coupling.